

ESTIMATED GROUND-WATER PUMPAGE
IN THE LOWER SAN PEDRO
BASIN AREA

[Numbers rounded to nearest
thousand acre-feet]

Year ¹	Pumpage, in thousands of acre-feet
1966	30
1967	29
1968	42
1969	51
1970	58
1971	51
1972	53
1973	57
1974	61
1975	59
1976	67
1977	62
1978	55
TOTAL	675

¹Pumpage not estimated
prior to 1966.

EXPLANATION

- 3100 ——— WATER-LEVEL CONTOUR—Shows approximate altitude of the water level. Dashed where uncertain. Contour interval 100 and 200 feet. Datum is mean sea level
- 126
3114
249 • WELL IN WHICH DEPTH TO WATER WAS MEASURED IN 1978—First entry, 126, is depth to water in feet below land surface (F, flowing). Second entry, 3114, is altitude of the water level in feet above mean sea level. Third entry, 249, is depth of well in feet
- 0.55
3750 • SPRING AT WHICH DISCHARGE WAS MEASURED IN 1978—First entry, 0.55, is discharge of spring in gallons per minute. Second entry, 3750, is altitude of the land surface in feet above mean sea level
- (B) WELL FOR WHICH A HYDROGRAPH IS SHOWN
- APPROXIMATE AREA IN WHICH DEPTH TO WATER IS LESS THAN 50 FEET BELOW THE LAND SURFACE
- APPROXIMATE AREA WHERE GROUND WATER OCCURS UNDER ARTESIAN PRESSURE
- APPROXIMATE BOUNDARY OF THE MAIN WATER-BEARING UNITS—The main water-bearing units are flood-plain alluvium and valley-fill deposits. The flood-plain alluvium consists of gravel, sand, silt, and clay. The valley-fill deposits consist of gravel and sandstone and siltstone beds. The granitic, volcanic, and sedimentary rocks that make up the surrounding mountains may yield a few gallons per minute where sufficiently fractured
- GENERALIZED DIRECTION OF GROUND-WATER FLOW
- ARBITRARY BOUNDARY OF GROUND-WATER AREA

The lower San Pedro basin area includes about 1,550 mi² in southeastern Arizona. The main water-bearing units are the flood-plain alluvium and the valley-fill deposits. The flood-plain alluvium is about 40 to 150 ft thick and consists of gravel, sand, silt, and clay. The valley-fill deposits are a few feet to as much as 1,800 ft thick and consist of gravel and beds of sandstone and siltstone (Roeske and Verrell, 1973).

Surrounding mountains are composed of granitic, volcanic, and sedimentary rocks; wells in these units generally yield only enough water for livestock and domestic supplies. Springs that issue from these units generally discharge only small amounts of water—measured discharges ranged from 0.06 to 112 gal/min. Leroy Spring, which is in sec. 17, T. 6 S., R. 16 E., was flowing 1,580 gal/min on January 10, 1969; however, the spring was not flowing on September 29, 1978.

Ground-water movement in the area generally is from the mountain fronts toward the San Pedro River, then northward through the center of the basin. Only one reach of the river is perennial; the reach starts about 9 mi south of Redington and is less than 3 mi long. Ground water generally occurs under water-table conditions in the flood-plain alluvium and under both artesian and water-table conditions in the valley-fill deposits. Ground water is under artesian head in an area that extends from about 5 mi north of Redington to Mammoth. Most irrigation wells obtain water from the flood-plain alluvium, and yields are generally between 200 and 1,500 gal/min. A few of the high-capacity wells obtain water from the valley-fill deposits (Roeske and Verrell, 1973, p. 14).

In 1978 the estimated ground-water pumpage was 55,000 acre-ft, 30,000 acre-ft of which was used for irrigation. For 1966-78, the estimated pumpage was 675,000 acre-ft. Ground-water withdrawal has had little effect on water levels in the area. However, the water level in a well west of Mammoth declined about 23 ft in 11 years (see hydrograph C). Water levels fluctuate seasonally in response to recharge from the San Pedro River; static water levels in wells in the flood-plain alluvium rose during the winter of 1978-79 owing to sustained flow in the river.

The hydrologic data on which these maps are based are available, for the most part, in computer-printout form and may be consulted at the Arizona Department of Water Resources, 222 North Central Avenue, Suite 850, Phoenix, and at U.S. Geological Survey offices in: Federal Building, 301 West Congress Street, Tucson, and Valley Center, Suite 1880, Phoenix. Material from which copies can be made at private expense is available at the Tucson and Phoenix offices of the U.S. Geological Survey.

SELECTED REFERENCES

- Brown, D. E., Carmony, N. B., and Turner, R. M., 1978, Drainage map of Arizona showing perennial streams and some important wetlands: Arizona Game and Fish Department map, scale 1:1,000,000.
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- Davidson, E. S., and White, N. D., 1963, San Pedro River Valley, in Annual report on ground water in Arizona, spring 1962 to spring 1963, by N. D. White, R. S. Stulik, E. Morse, and others: Arizona State Land Department Water-Resources Report 15, p. 68-76.
- Heindl, L. A., 1952, Lower San Pedro basin, in Ground water in the Gila River basin and adjacent areas, Arizona—a summary, by L. C. Halpern and others: U.S. Geological Survey open-file report, p. 87-99.
- National Academy of Sciences and National Academy of Engineering, 1973 [1974], Water quality criteria, 1972: U.S. Environmental Protection Agency Report, EPA-R3-73-038, 594 p.
- Roeske, R. H., and Verrell, W. L., 1973, Hydrologic conditions in the San Pedro River Valley, Arizona, 1971: Arizona Water Commission Bulletin 4, 76 p.
- U.S. Environmental Protection Agency, 1976 [1978], Quality criteria for water: U.S. Environmental Protection Agency publication, 256 p.
- 1977a, National interim primary drinking water regulations: U.S. Environmental Protection Agency Report, EPA-570/9-76-003, 159 p.
- 1977b, National secondary drinking water regulations: Federal Register, v. 42, no. 62, March 31, 1977, p. 17143-17147.
- U.S. Geological Survey, 1978, Annual summary of ground-water conditions in Arizona, spring 1977 to spring 1978: U.S. Geological Survey Water-Resources Investigations 78-144, maps.

CONVERSION FACTORS

For readers who prefer to use metric units rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi ²)	2.590	square kilometer (km ²)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm ³)
gallon per minute (gal/min)	0.06309	liter per second (L/s)

